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POLLUTION FROM MORWELL POWER PLANT PREDICTED

Melbourne THE AGE in English 14 Sep 77 p 11

[Text]

Emergency gas turbines at Morwell will produce twice as much pollution as the proposed Newport power station.

The turbines are being installed to meet energy shortfalls caused by delays to the 500 megawatt station at Newport.

Morwell was originally rejected as a site for the station.

Both SEC and Environment Protection Authority officials confirmed yesterday that the turbines would significantly affect air quality levels in the Latrobe Valley.

Morwell was found to be the worst possible site for the power station when the EPA graded a number of sites for the Newport Review Panel earlier this year.

An EPA officer claimed yesterday that the licence for the turbines, to be granted soon, was a trade-off between the EPA and the SEC, forced by the State Government.

In return for the licence, the SEC had promised to conduct a \$1 million pollution monitoring and meteorological study of the Latrobe Valley.

The EPA was strongly opposed to granting the licence because the turbines greatly exceed accepted EPA emission standards for nitrogen oxides.

The licence is expected to allow the turbines to emit 165 parts per million of nitrogen oxides.

The original EPA recommendation was for 55 ppm. Proposed US standards are for 75 ppm.

The SEC's assistant general manager (development), Mr. Jack Johnson, said yesterday that the SEC could not have found a single, suitable site for

the turbines anywhere in the State.

But he stressed that overall air quality levels in the valley would still be well within the US standard.

Mr. Johnson denied that the EPA had initially rejected the licence application.

But, the EPA and SEC were not able to agree on licence conditions and the dispute was eventually brought before the Premier, Mr. Hamer.

Mr. Hamer acted as a catalyst to the final agreement between the two. He did not attempt to force a decision one way or the other, Mr. Johnson said.

The EPAs acting chief air quality officer, Mr. Frank Smith, said yesterday the EPA could not be 100 per cent sure of the turbines' environmental impact "but we can't wait for the results of the study".

The study's findings could eventually force the SEC to lower the turbines emission levels through more stringent EPA licence conditions.

Two of the four 50 megawatt turbines, supplied by the West German company Siemens, have already arrived.

The turbines cost \$45 million and are expected to be in operation by the middle of next year.

Chimney stacks of only 32 metres on the turbine station are expected to contribute significantly to ground-level pollution.

The chimney on the Newport power station will be 188 metres.

Mr. Johnson said the height of the chimneys had been restricted at the request of the EPA's licensing agent, the Latrobe Valley Water and Sewerage Board, for aesthetic reasons.

AUSTRALIA

BRIEFS

MELBOURNE POLLUTION--Melbourne was ready to join the big league of polluted cities, the chairman of the Environment Protection Authority, Mr Jack Fraser, said last night. Increasing hydrocarbons and carbon monoxide levels made it a potential league applicant, he said. He said air quality would be Melbourne's most difficult pollution problem over the next decade. The chief causes would be photochemical smog and increased particulate emissions. Mr Fraser said at Swinburne College of Technology that the state's growing reliance on coal--as gas supplies dwindled and oil prices rose--would further pollute the air. Atmospheric lead--a metabolic, accumulative poison--would also become controversial. Lead in petrol was a principal source of atmospheric lead. It also reduced petrol consumption. [Text] [Melbourne THE AGE in English 14 Sep 77 p 3]

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BULGARIA

OGOSTA RIVER POLLUTED AT ALARMING RATE

Sofia NARODNA MLADEZH in Bulgarian 17 Sep 77 p 2

[Article by Radost Nikolaeva, special correspondent, date-line Chiprovtsi-Oryakhovo: "Water a Casualty: Man and River at the Border-Line between Enmity and Friendship"]

[Text] In view of the extreme need for pure water for industry and agriculture and the acutely urgent pollution problem of our rivers, the newspaper NARODNA MLADEZH [National Youth] has organized an expedition along the Bulgarian rivers. Their preservation raises a wide range of questions for public opinion having to do with the felling of forests, the planning and construction of modern treatment facilities at enterprises, efficiently operating urban treatment stations, and the introduction of modern, minimally "toxic" manufacturing methods at plants, which young and talented specialists should be involved in devising. Questions involving the training of personnel who will work competently for the protection of natural resources. And not least, for the preservation of the soil and underground water.

Many of our deep rivers have already been turned into sluggish creeks that one can wade across in places. No wonder! Suffice it to recall modern capacities and to multiply these indicators times the amount of water necessary for various production processes. It takes 50 tons of water to produce 1 ton of steel. An average of 500 tons are consumed per ton of dye; 1500 tons are needed per ton of rayon, and 2500 tons per ton of caprone.

Modern production requires more and more pure water, which is sometimes hard to purify after use. And let us not forget the intense expansion of reclamation projects. . . . It takes 300 to 500 cubic meters of water to produce 1 ton of grain alone.

River pollution is not "purely" a natural problem. It is directly intertwined with people's lives, with the economy, with their very existence.

And so -- let's go!

Actually, everything began with the ancient city of Augustus which was situated in the valley of the Ogosta River and gave it its name. Its inhabitants probably had experience in the ordering of worldly affairs and self-confidence by nature, as is indicated by the characteristics of their city-planning decisions. There is something significant in the fact that they called the river their "home," projecting on it, as it were, their view of the integral relationship between man, city and nature . . .

My fellow traveler, Iliya Petrov, was born in the village of Kopilovtsi at approximately the very source of the Ogosta. When construction of a cultural institute was started there several years ago, domes of the Santa Maria church showed up in its foundations. Iliya at that time was already in the barracks as a matter of fact, and was informed of how things were going by 84 letters from his girl, in which tales of the underground empire on ~~one~~ side of the river were blended with evenings along it, with Kopilovtsi and love.

We decide to make our expedition along the Ogosta against the current . . . of time.

The Ogosta as a Psychological Problem

"Ours was a wonderful river," Iliya recounted. "Perhaps the emperor came specially to have a dip in it. But as things have turned out . . ."

We found ourselves in Mikhaylovgrad at a not very propitious time. Merely at the mention of the Ogosta the people fell into a panic. The city was gripped by an "epidemic" of fear. In the stations, in the restaurants and at "important administrative offices," talk was of the same thing: due to the building up of water in the new dam lake the connection with the local water source was interrupted and the drinking water was drawing in the water of the Ogosta. In spite of all the sober arguments that there was no real threat to the health of the citizens, the psychological shock among some Mikhaylovgrad inhabitants was unquestionable. We bring up "this question," not to provoke "still more" public alarm, on which everything has the same effect in any event. There is something else: Today not a single Mikhaylovgrad inhabitant, it seems, is indifferent towards his river. By virtue of a quite commonplace psychic mechanism the people believed that the Ogosta had at last turned against them. The critical situation emphasized the strength of the threat that resulted from the breached connection between river and man.

They told us the Ogosta is now a "pilp" of rocky mass, iron, lead, arsenic, cyanides, waste matter from toilets, feces, chrome . . .

They told us the Ogosta used to be . . .

Granny Slavena's Tears

The village of Belime1 is situated in the river valley in the direction of the Georgi Damyanov Woodworking Mill. Granny Slavena lives in the last house with a large yard, but no water. "Once," the old woman said, "our river was pure and beautiful. We did our laundry in it and even drank the water. Such a river. You could see the bottom and the fish moving to and fro. But we didn't spare the Ogosta. We hurt it."

Here for the entire length of the river bed there flows a blue ashen slurry, which in fact gives no signs of life and movement. The water cannot be used for irrigation, and as for fish, they have passed into the lore of children's fairy tales. "Technology ruined the river," Granny Slavena cried, "and there won't be any chance to save it!"

The Ogosta as Economic Problem

In the woodworking mill we were met by branch chief Ivan Petkov. "Our pollution is quite small," he said, "in comparison with the pollution in Chiprovtsi. Only one dump-truck of dust per week . . ."

The dust from the polisher in the plywood shop, due to the lack of suction apparatus, is discharged into the river, gets between the gills of the fish and suffocates them. "The fish are at the point of extinction," said the chief with conviction. "The little stream is white with wood." When the treatment plant is to be put up is not known. It should have been, but there was nobody to build it. There were no people for the job; the plan had to be fulfilled. But if this is how matters stand, all the machinery in the plywood shop has to be replaced. "I can't give this money out of my own pocket," the chief said.

Departmental ABCs

The Ogosta is the hub of departmental ABCs . . . deliberations. Take the problems connected with the construction of treatment facilities at the Khristo Mikhaylov MOK [Mining and Concentration Combine] at Chiprovtsi. The mines, copper concentration combine and two flotation plants are located several kilometers from the source of the Ogosta. Quantitatively, it is the greatest polluter for the entire extent of the river. A treatment facility was built as far back as 1966, but by the decision of an authorized commission it was halted as being "potentially dangerous." "Without closing down the enterprise at the same time," the director Manol Kyutinski added. From this moment on, for seven years, dozens of commissions came through the project, each with its own proposals and programs for the construction

of a tailings dump (a settling tank for polluted water). During this time some departments were closed, others were consolidated; the people who get problems "moving" were shifted from position to position. . . . In 1969 the staff of Energoproekt [Scientific Research, Design and Planning Institute of Power Construction] put forward their "effective" idea at . . . the huge cost of 11 million leva. The Nonferrous Metallurgy State Economic Trust, however, did not have such a sum "in its pocket." New plans were discussed. . . . The last one was approved four years ago. No construction contract was signed, however, until a year later and the draw-down of funds began: 21 percent in 1974, 45 percent in 1975, 76 percent in 1976. And whereas 400,000 leva were supposed to be drawn down the first year, in order for the first stage of construction in 1978 to be completed, construction worth more than 1 million leva has to be accomplished. Obviously, the unsystematic planning will confront the project with new problems. On 30 June 1977 by special decision of the Council of Ministers, the Khristo Mikhaylov MOK was provided with 500,000 nonplanned leva for overfulfillment of construction work. But owing to bad organization, the executive officer of the Hydraulic Construction State Economic Trust in the person of the SU [Construction Administration] in Khurlets will barely succeed in utilizing 100,000 leva. In addition, some of the hydraulic construction men travel more than 100 kilometers to the project and when they get there, "they prefer to sleep rather than work," as Vasil Vasilev, chief of the rayon environmental protection inspectorate in Mikhaylovgrad, figuratively expressed himself.

Thus day after day the problems of the Chiprovtsi tailings dump were postponed, and the iron, lead and rocky mass were deposited in the Ogosta River bed.

By way of paradox, at the same time the Hydraulic Construction State Economic Trust was building a dam lake at Mikhaylovgrad. But contrary to the hydraulic know-how of its specialists, it ventured to fill it with water before the Chiprovtsi tailings dump was finished. As a result, the connection between the water source and the dam lake was interrupted and Mikhaylovgrad inhabitants were frightened by the possibility of seeing the Ogosta on their tables.

Hypocritical Modesty

According to the modest acknowledgment of Director Kyutinski, the pollution from the Khr. Mikhaylov MOK is insignificant in toxicity as compared with the wastewater from the Martinovtsi tannery. At Mitrovtsi the Ogosta stinks and is comparable to a mud flow. The plan for a treatment station has not been realized for years, but he sees the end before the end of this year. This year the Pirin State Economic Trust adopted a proposal for a treatment station or a changeover to dry processing of hides, in which ~~event~~ there is no longer a need for a treatment station. Financing is provided also. For the present this is all. For the present, bases, sulfates and sulfuric acid escape into the river. For the present, "Understand us," sighed Mladev

Nikolov, director of the tannery. "For many years we argued with the ministries and departments, but some even convinced us that if the rivers are clean, it means we have no industry. . ."

The greatest stock-breeding polluter of the Ogosta is the swine complex in the village of Studeno Buche, which incidentally is the largest reproduction center in the country. Several years ago, on the day the swine complex was opened, its treatment station failed to operate due to shortcomings in the plan. From that day to this, more than 20 commissions have been sent here to find a competent solution to a difficult situation. Five or six months ago the new plan costing about 100,000 leva was entrusted to Vodokanalproekt [Water Supply and Sewerage Planning Service], but disputes over its implementation, of course, have not ended. . .

One of the plants polluting the Ogosta at Mikhaylovgrad is the Electro-acoustics Plant. Here the problem is a special one. In 1967 the enterprise paid for a treatment station plan, but since the plan dragged on for two years, and later on there were difficulties in financing the facility, one day it proved to be obsolete. Now a new one (twice as cheap!) has been created. "If it depended on us," says Director Georgi Krustev, "we would have built the treatment station for ourselves before this. Any other way you have a hard time . . . finding designers, finding construction men. . . . Now the construction men are objecting. Everyone screams, 'This isn't our job. We haven't built anything like this. . .'"

All the plants in Mikaylovgrad are adapted for only partial treatment of industrial wastewater. Full treatment has to be done at an urban treatment station. But it does not exist, nor does it exist in Berkovitsa. Near Boychinovtsi there empties into the Ogosta a tributary polluted with ammonia from the chemical combine at Vratsa, where no treatment station exists, either.

The Ogosta as a Human Problem

The river and man exist side by side, but man lifts his hand to wound it. Will it permit itself to be turned against him regardless of the fact that until then it had been part of man's life story, his well-being, his sustenance, his very self.

Will Granny Slavena's tears be enough then to wash away the enmity between man and the river?

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CZECHOSLOVAKIA

SSR ENVIRONMENT PROTECTION MEASURES DISCUSSED

Bratislava NEDELNA PRAVDA in Slovak No 35, 2 Sep 77 pp 6,7

[Article by Dr Rudolf Demovic, CSc.]

[Text] The SSR Ministry of Construction Development and Technology has worked out in 1974 a concept of care for the living environment up to 1990. These studies have revealed that the greatest threat to the living environment exists in Bratislava, Kosice, Jelsava, in the valleys of the Nitra, Vah, and Rhon Rivers, where the inhabitants represent as much as 60 percent of the population of Slovakia. About 6 billion korunas are to be invested during the Sixth Five-Year Plan for protection of the living environment.

Prevention of Pollutants

The greatest emphasis is placed today on reduction of air pollution where the air is polluted most and has an unfavorable effect not only on fixed assets, but also on the health of the population. The complexity of elimination of air pollution is increased even more by the present situation with regard to fuels and power, which makes it impossible to carry out certain measures, particularly when it is a question of switching from less effective fuels to more refined fuels, which are not available in the country.

The total amount of noxious substances which were found in Slovakia in 1975 was 1,300,000 tons, including 520,000 tons of solid pollutants. Last year, successful efforts were made to reduce their amount to 500,000 tons. A total of 42 technical installations were built to capture solid pollutants. For example, at the combine in Zahorie the discharge of dust in the air is 0.4 kilogram per ton of cement as compared to 21 kilograms of the average discharge from the cement works in 1963. It is technically feasible to capture solid pollutants. This is confirmed by the fact that electrostatic and combined filters can capture as much as 99.6 percent of particles discharged in the air. The situation is much more complicated when gaseous pollutants are captured because suitable technological equipment has not been designed as yet. Good results have been obtained in

that respect at the Grafobal in Skalica and at the "Gumarny" [Rubber Works] in Dolne Vestenice. At the present time, the boiler plants are being reconstructed at the Meat Combine "Masokombinat" in Trencin and at the Meat Processing Establishment ("Masozavod") on the Myjava River.

Gasification and reconstruction of boiler plants for liquid fuels in the Central Slovakia Kraj eliminated 14 sources of air pollution. By building a chimney stack 300 meters high at the ENO Electric Power Plants at Novaky, the dispersion of sulfur oxide in higher layers of the atmosphere has improved. In the West Slovakia Kraj, more than 6 million dollars have been invested last year in reconstruction of obsolete and inadequate boiler plants and in the construction of new ones. From 1 June 1975 to 31 May 1976, almost 5,300 inadequate transportation means have been put out of operation in that kraj. The National Committee of Bratislava, the capital city of the SSR provided for reconstruction of 43 boiler plants from solid fuels to natural gas in 1974-1976, and by building 12 exchange stations it created conditions for liquidation of additional 24 boiler plants using solid fuels. The result is that the amount of pollutants decreased in Bratislava from 460 tons per square kilometer in 1971 to 240 tons per square kilometer in 1975. Last year, the amount of sulfur oxide in the air decreased almost 50 percent as compared to 1975. This was done primarily by putting out of operation obsolete production plants at the CHZJD [Juraj Dimitrov Chemical Works] in Bratislava, as a result of which emission decreased by 3,500 tons. Special attention is paid to the possibility of desulfurization of heavy heating oil at Slovnaft in Bratislava, where a long-term concept of protection of the living environment is being worked on at present. What will be of essential significance in terms of sanitation of the air in the capital city of Slovakia is also elimination of the production of carbon disulfite by the end of the year and of viscous fabric by the end of 1978 in the CHZJD.

Unfortunately, there still exist enterprises and manufacturing establishments where the management workers are not taking adequate care of protection against air pollution. They fail to provide for perfect operation and maintenance of the installations, and as a result the rate of breakdowns of the installations is increasing, and consequently noxious substances are also escaping into the air. National committees, acting in cooperation with the State Technical Inspection for Protection Against Air Pollution, imposed fees and fines on organizations in the amount of almost 50 million korunas, and fines on individuals in the amount of about 15,000 korunas. However, it will be necessary to proceed more consistently against undisciplined persons, and especially it will be necessary to take preventive measures.

The executive plan for this year includes additional 13 new priority investment programs for protection against air pollution. Most of them are to be carried out as late as in 1981-1982. However, one can expect that they will have a positive effect on efforts to improve prevention of air pollution even during the current five-year plan. These programs concentrate for example on liquidation of pollutants from the Slovak Magnesite Works in Jelsava, on capturing noxious substances at Kovohuty

of new production facilities, especially in the chemical and cellulose-paper industry, include in the constructions water circulation or use of air coolers. This applies for example for Slovnaft in Bratislava or to Petrochema in Dubova. The SSR Ministry of Agriculture and Nutrition also requires that cooling water systems be calculated in the costs of construction or reconstruction of certain sugar refineries or alcohol distilleries.

What continues to be a special problem is the use and liquidation of sedimentation sludge coming from purification plants of waste waters, in spite of the fact that such sludge constitutes a convenient fertilizer for agricultural purposes. The sludge which is formed in purification plants of waste waters in primary agricultural production plants and plants of the food industry, can be used after appropriate treatment for fertilization of agricultural land.

Is the Decrease of Soil Slowing Down?

The decrease of agricultural land was reduced substantially last year after the approval of the law on protection of agricultural land. While in 1975 the agricultural land decreased by almost 42,000 hectares, the decrease last year amounted to less than 14,000 hectares. As the agricultural land kept decreasing, recultivation of land began much more consistently, particularly recultivation of land devastated by mining. The chemical industry also improved the situation in that area by producing new preparations.

The construction of household and industrial trash disposal facilities and further processing of waste material means that there is less need for using agricultural land for storing such waste material. In January of this year, the first waste material disposal plant in Bratislava put in operational test the first aggregate which processes 12 tons of waste material per hour, or 32 tons of steam per hour. Additional two aggregates with the same output will be completed this year. Industrial processing of waste material will be rationalized by the planned introduction of technological equipment of the Gondard system, which was purchased under license from France. The first compost plant based on this principle is being completed in Presov, and the second plant is at the projection stage in Zvolen. One million tons of organic fertilizers are to be produced by 1980 from waste material processed in this way, from waste sludge and waste waters coming from purification plants.

Many of the solid waste materials are actually rich raw materials which are in short supply. That is why it is necessary to evaluate positively the fact that there exist now several establishments in Slovakia where this problem is being solved successfully. For example, the SNT Works in Ziar nad Hronom have checked the possibility of using brown sludge taining 30 to 35 percent of iron in iron works. By using carbide lime

(Metallurgical Works) in Krompachy, on reducing pollutants from the thermal power plant at the SNP Works in Ziar nad Hronom, and so on. Dedusting equipment will be installed at the Chemical Works in Istebne, and preparations are also being made to install separators at Chemek in Strazske, at the ZDA in Partizanske, at Smrecina in Banska Bystrica, and so on.

Construction of Purification Plants for Waste Waters Keeps Lagging Behind

About 500 purification plants should be built to reduce the critical pollution of 1,400 kilometers of waterways in Slovakia, particularly of the Vah, Nitra, and Rhon Rivers. Additional 34 purification stations were added last year to the 101 purification plants for waste waters, which were built during the Fifth Five-Year Plan. These stations include also important installations such as purification plants of waste waters at the Yugoslav cellulose mills and paper mills in Sturovo and at "Bukoza" in Vranov. Additional very important purification plants for waste waters, which are fully automated, are under construction and in the preparatory stage. This applies for example to purification plants at Bosany, at the "Preglejka" [Plywood Works] in Zarnovica, as well as extensive joint purification plants of waste waters at Ruzomberok and Zilina. One can assume that these constructions will improve substantially the degree of purity of the waters not only in rivers, but will also protect underground waters of the Zitny Island.

However, the fulfillment of the plan of the construction of purification plants for waste waters keeps lagging behind, and many of the plants are not finished yet. Out of the total amount of 228 million korunas allocated last year for the construction of these purification plants, only a small amount has been invested, and the investors and suppliers completed only 34 out of the planned 65 purification plants. The reasons for this unfavorable state of affairs continues to be practically the same. They are in particular lack of conceptual clarity, inadequate and poor project preparation, shortcomings in providing progressive technologies for use by the suppliers and for deliveries, shortcomings in their installation, and also great shortcomings in the work of the investors and inconsistent implementation of the tasks of contracting building organizations. Penalties have also been increased for violations of water protection. Last year alone, national committees imposed more than 170 fines on organizations in the amount of almost 11 million korunas, and on 84 individuals in the amount of over 40,000 korunas.

Naturally, in the construction of new power facilities and industrial facilities as well as in the reconstruction of old ones it is necessary to concentrate not only on the construction of purification installations, but above all on the introduction of technologies which result in "little waste" or in "no waste", and to use to the maximum extent possibly recirculation of cooling waters, and also to use closed circuits of waters. For example, the SSR Ministry of Industry requires that builders

from the Wilhelm Pick Chemical Works in Novaky, it is possible to obtain thousands of tons of mortar cement of good quality. By solving the problem of collection and grading of light ashes obtained from the electric power plant in Novaky, it is possible to obtain annually an additional amount of almost half a million ton of light ashes for the manufacture of light construction material, and so on.

Last year, successful efforts were made to reduce noise at Matadorka in Bratislava, at the "Chemiceluloza" in Zilina, at Bukoza in Vranov, Harmanec Paper Mills, at "Polana" in Lucenec, at the ZDA Partizanske, at the "Koziarske Zavody" [Tanneries] in Liptovsky Mikulas, at the MDZ Works in Bratislava, at "Pleta" in Bansak Stiavnica, at Duklianske Printing Works in Presov, and at "Svornost" in Bratislava. This was done by insulating hermetically the installations, by lining the walls, or by building insulated operational cabins.

In conclusion, it should be noted that the Project of Urbanization of the SSR was approved last year as well as the law on territorial planning and orderly process of construction work, which came into effect on 1 October. Both these documents are very important for the protection and creation of the living environment and will have a positive effect on further intensification and improvement of the quality of the care for the living environment in Slovakia.

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ENVIRONMENTAL EFFECTS OF COAL MINING EXAMINED

East Berlin BAUERN-ECHO in German 30/31 Jul 77 p 8

[Article by Prof Dr A. Krummsdorf, Wilhelm-Pieck University, Rostock: "Coal Mining Forms the Landscape"]

[Text] Brown coal continues to be an essential and basic raw material and the most important energy source in our national economy, and so it will remain in the next decades. Some 85 percent of energy requirements are covered by the coal industry. Our statistics demonstrate that the GDR occupies the foremost position in brown coal mining on a worldwide scale. In conjunction with efficient refinement technology, hauling methods oriented to this top position, such as top-layer hauling frameworks with a 60 m excavating capacity, assure the necessary coal extraction and thereby the energy balance.

Coal mining involves interference with the landscape which inevitably results from the extraction and devastation of resource-laden areas. The total alteration of the mining areas makes brown coal mining the greatest shaper of the landscape. Under capitalist conditions it was the greatest "disfigurer of the landscape." Today it has become, for us, a partner in planned land development fulfilling social responsibility as a branch of the national economy.

Profit Seeking Destroyed Landscape

Regarding the potential of the landscape it may be observed that natural landscapes in the ecological sense are scarcely to be found anymore in the mining areas. Rather, mining in the area of Halle-Leipzig and Lusatia traverses land cultivated for thousands of years and extensively exploited, land which for a long time has been more or less industrially shaped and manifoldly developed culturally through above- and below-ground building and transportation facilities.

Since industry created higher land values than agriculture and forestry were ever able to do, the tendency of the mining landscape toward quick and desultory development as well as toward faulty localization was unmistakable in the past; the geographer J. H. Schultze described this as early as 1931. Capitalistic private property, profit seeking, and land speculation hindered

both comprehensive planning of the mining and restoration of the land. Perhaps it was just for this reason, however, that rational territorial regulation was first initiated by the mining industry over 50 years ago, even though, for the previous reasons, large-scale improvements were naturally still prevented for a long time. Only with the power of the workers and peasants was there a natural interest in restoration and advance planning in conjunction with coal mining.

First of all, with the system of mining reservations, areas reserved for mining use were created. Thus, for example, in Landkreis Leipzig 41 percent is identified as a mining reservation. In Kreis Borna the figure is 50 percent, and in Kreis Delitzsch roughly 75 percent. These reservations cover the period until about the year 2000. Based on present mining operations, about .04 percent of areas used for agriculture and forestry throughout the nation are affected annually. In this connection it must naturally be considered that the mining industry operates in specific areas of concentration determined by the locations of deposits, and these areas of concentration must receive suitable consideration in national economic plans.

High Soil Fertility for Stable Output

Efforts toward a qualitative improvement of these reclaimed areas have been topical for a long time. The legally required, economically necessary minimum quality is called "minimum fertility." It is the basis of a conspicuous, technologically based program of developing cultivated land, filling, and leveling. At the same time, raw ground forms unfavorable to cultivation or less suited to vegetation are dealt with through land melioration and soil improvement according to expert technological evaluation of the soil, just as drainage and road construction are undertaken as tasks of land reclamation involved with mining. Hence essential preparations for subsequent agricultural and silvicultural recultivation are accomplished, including that of exhausted open-cast mines (residual pits).

We see in the reduction of the time interval between minimum and full fertility of the soil a great opportunity, to be exploited much more fully, for [realizing] the potential of the landscape. But it is necessary during this recultivation period, on the basis of a preferentially promoted land formation process, to create ever better preconditions for the lasting use of dumping sites and a stable increase in output in the years to come.

Multiple Use of Open Cast Residual Pits

The measure of the reclamation of mining areas is the cumulative result up to the present state of affairs. In this connection, a rough orientation for the Leipzig area is that from 1920 to 1970 about 25 percent of the mined areas were reclaimed for the post-mining landscape. According to territorial planning data, however, the figure by the year 2000 must be at least 75 percent of all areas. Thus as compared with 25 percent in the first 50 years, in the next 25 years over 50 percent of the mined areas must be reclaimed. This

means more than twice the result in half the time; and it must be considered in this connection that, with respect to land and location, conditions are becoming more and more difficult. Some 15 to 25 percent of the areas to be reclaimed are piles of rubble, and about one third of the sites contain concavities, i.e. water surfaces, residual pit slopes, and adjoining safety strips.

In the open-cast residual pits lie particular terrain advantages and possibilities for multiple use in land cultivation (recreation, fishing, water reservoirs, etc.), as already exemplified by Klkwitz-Miltitz, Panna, Lake Senftenberg, and Pless/Gruenewald-Lauch. Residual pits and rubble heaps also form the basis of an intensified silvicultural reclamation of our mining areas with richly varied topography in the interest of the populace.

An inevitable destruction of soil and landscape in the mining process is preceded or at least accompanied by obligatory territorial programs incorporating the post-mining landscapes. The individual stages of planning should be dynamically adapted to the progress of open-cast mining, and influence is to be exerted on the latter to guarantee optimal subsequent use in the perspectives of national economy, territorial planning, and land cultivation.

Landscape-Shaping Plans and Partial Predictions up to 2000

The first planning concepts were already developed for the southern Leipzig mining area in 1954 by G. Scheerer, who effectively realized them through extensive plantings in Boehlen/Espendhain, Trages, Witznitz, Windischleuba and in the Wintersdorf-Waltersdorf-Zechau area. Via the reclamation plan for the Kulkwitz open-cast mine in 1958 (Walter/Holzappel), methodological and substantive progress then led to the first complex plan in decades from 1960 to after 2000 (Pfeiffer), until finally, in the framework of the partial forecast "Socialist Land Cultivation" of the Leipzig Bezirk, a study serving as a plan for the development of the post-mining landscape (long-term plan) could be compiled in the Office of Territorial Planning/Office of Mining Affairs.

Through goal-directed mining measures and active recultivation, land exhaustion was reduced and there resulted a planned reproduction of land resources. Quantitatively and qualitatively it is now being developed into a reorganization of the landscape and its cultivation.

The social responsibility of the territorial planners, landscape architects and technologists, miners, and subsequent users participating in this process increases along with the greater requirements. Their achievements are already measured by the condition of our present-day mining landscapes.

8992

CSO: 2300

ARGENTINA

INDUSTRIAL WASTES RAISE PLATA RIVER POLLUTION TO ALARMING LEVEL

Buenos Aires LA PRENSA in Spanish 16 Sep 77 p 10

[Text] "Pollution of the waters of the Plata river and its tributaries in the greater Buenos Aires area has reached alarming levels, and in some places the germ counts reach levels considered normal for the contents of sewers."

This statement is contained in a top-level memorandum on the subject to the authorities of the undersecretariat of water resources from technicians of German Water Engineering, a state enterprise of the Federal Republic of Germany.

The authors of the memorandum, released yesterday by the NOTICIAS ARGENTINAS news agency, emphasize that the high levels of contaminants in the waters of the area result from discharges of the industrial establishments in the Plata basin; they noted also the importance of polluted water in sewer systems and the so-called "black wells."

The study was sent to the former assistant secretary for water resources, engineer Luis Urbano Jauregui, through the director of the National Institute for Water Science and Technology (NIWST), engineer Alberto Casanas. It recommends further study to determine precisely the causes and amounts of contamination.

The news agency release states that according to information available the cost of the study and projects would be about 9 million German marks, presently \$3.5 million U.S. or 1.575 billion pesos.

The study presented by the German technicians analyzes a surface area of 1,800 square kilometers, including this capital and the surrounding area, with a population of about 9 million persons.

Other Contents of the Document

The memorandum notes that in the area under consideration the number of industrial establishments of various kinds has been estimated at about

70,000, and it is estimated also that their total pollution potential is equal to that of another 4.5 million inhabitants.

It is noted also that totally spontaneous urban growth has blocked any attempt to fight environmental pollution.

Causes and Effects of Pollution

The German technicians cite the following as principal causes of water pollution: discharge of untreated or insufficiently treated fluid wastes from industrial establishments, discharge of fluid and mud from sewers, flooding caused by rainwater which has picked up pollutants, oil spills and dumping of wastes.

It states that in one stretch of water several hundred meters wide along the Plata coast, there is a high level of bacteriological contamination, and it mentions the Reconquista and Matanzas-Riachuelo rivers as the principal source of pollution of the Plata river water in the area.

Disease-bearing Germs

It is stated that these two rivers are simply poisonous along certain stretches, especially where the Reconquista crosses National Highway No. 8, as well as where the Matanzas-Riachuelo crosses the Ricchieri freeway.

At these two locations the Coli bacteria count, indicating the presence of disease-bearing germs, such as polio virus and infectious hepatitis, reaches levels considered normal for the fluids in sewers.

Industrial Establishments

According to the analysis of the technicians, the greater part of the contamination comes from discharge of industrial wastes. Activities which were noted as having greatest impact include washing wool, treating leather, slaughtering livestock, dealing with oil and related chemicals, metal refining, making paper, processing chemicals, and producing food.

Other Sources of Pollution

On the subject of other sources of pollution, a distinction was made between the federal capital and the surroundings which have sewer systems, as contrasted with the vast sprawl in surrounding districts where the "black wells" are abundant.

Regarding sewer systems, it was noted that the majority of the discharges of polluted water takes place along the Berazategui coast, south of Buenos Aires, where a daily volume of 1.5 to 2 billion liters is discharged. On the other hand, the "black wells" involve the risk of contaminating waters underground (subterranean lakes) with unforeseeable consequences.

It was pointed out that the trucks which pump out septic tanks should dump the material into sewer openings, but instead dump it often into ditches or gullies because of the scarcity of sewer inlets or because it is more convenient at the moment.

Measures Proposed

The study presented to the authorities of the water resources subsecretariat proposes measures for determining, in the first phase, the extent of pollution caused by industrial establishments, in order to develop later whatever plans are needed to stop the process and clean the environment.

It should be pointed out that German Water Engineering, part of the Salzgitter state group, specializes in the development and implementation of water projects, and has done important related work on great European rivers such as the Rhine and the Thames.

Lack of Official Information

Regarding the presentation of the study to the subsecretariat of water resources through the National Institute of Water Science and Technology, we asked the director of the latter body, engineer Casanas, for information on the contents of the memorandum, but he told us he did not have this information, since he had just received the study from the former assistant secretary for water resources and therefore had no more details to offer.

11,989

CSO: 5000

SYRIA

SEA, COAST POLLUTION PREVENTION, CONTROL MEASURES URGED

Damascus AL-BA'TH in Arabic 22 Aug 77 p 8

[Article by Kasir Ahmad: "What Is Needed To Protect Water Life: Development And Support of The Special Apparatus To Protect The Syrian Coast Against Pollution; Correcting the Problem of Water Pollution Violations, Not Just Collecting Fines; Preventing Fishing By Illegal Means Especially Dynamite"]

[Text] Eighty-five percent of existing pollution in the world is caused by industry. This is not, as some in the industrialized nations argue, a price that we must pay in order to develop and industrialize. On the contrary, it is the consequence of an industrial development which shows no responsibility towards the natural environment without which man cannot exist.

The 20th century man who mastered the atom and who travelled in space is certainly capable of constructing less dangerous and harmful factories; he is capable, if the need arises, of creating the necessary apparatus which will prevent harmful elements from polluting, destroying and killing.

Pollution Is Complex and Dangerous

AL-BA'TH discussed this topic with the director of port affairs of the General Directorate of Ports in Latikiyyah. He said that the subject of pollution is complex and dangerous. For these reasons the nations of the world feel that if this situation persists, it will constitute a danger to the environment and will destroy marine life. Hence, the first international conference was held in 1954 and resulted in an agreement to control pollution and its harmful effects and to fine the guilty parties.

Syria approved this agreement--international treaty--in 1968 which had been amended to include oil pollution of the sea.

Pollution Suffering of the Syrian Coast

The Arab Syrian coast suffers more than other countries from pollution due to the existence of three oil terminals directly on the coast. They are:

the Latikiyyah terminal, limited activity; the Banyas terminal, high annual activity; the Tartus terminal, medium activity.

These terminals are a major source of pollution for the Arab Syrian Coast. Dangers also lie in accidents that could occur such as pipe explosions or a leak in one of the pipes. Until the damage is repaired, huge quantities of oil could leak into the sea, causing pollution.

[Another cause of pollution] are tankers passing on Syrian or neighboring states' waters which usually flush their tanks causing a dense oil layer over a large area of the water's surface. In most cases, this layer heads towards the Syrian coast because of the permanent sea currents moving from the west and southwest in the direction of the Syrian coast.

In order to limit the harmful effects of these particles, to prevent the occurrence of these illegal acts, and also considering that Syria is a member of international organizations, a regulation was issued on the basis of which two committees were formed. The first committee is preliminary, composed of specialists and technicians, and it investigates pollution incidents, specifies responsibilities and assesses violators for the necessary damages.

The second committee is a higher committee composed of technicians and chaired by a judge whose grade is counselor. Its function is to review the decisions of the preliminary committee in the event they are disputed.

The director of port affairs stated that Syria took this measure in order to prevent pollution from occurring along the coast or to minimize it as much as possible. As such, the penalties imposed by the committees on violators have been severe. For example, a Swedish tanker paid 32,000 SL for violating pollution regulations. It is worth mentioning that fines are not less than 5,000 SL and may reach millions of pounds.

Other Sources of Pollution

The director of port affairs said that there are other less harmful sources of pollution which are the steam ships in Tartus and Latikiyyah. These, however, are treated like the other violating ships and tankers, and the overseeing committees investigate fully all matters in order to arrive at facts on the basis of which they assess responsibilities and fines.

The Mediterranean Is a Closed Lake

Given that the Mediterranean Sea is like a closed lake, its bordering Arab and European states noted that it faces an important danger, namely the destruction of marine life. Based on studies conducted by the concerned states it was revealed that approximately 300,000 tons of oil are annually dumped into the sea and if this situation continues, marine life will one day cease to exist in the Mediterranean and the entire body of water will become polluted. Also, since 100 years are needed for the waters of the Mediterranean

to change, the concerned states decided to hold the Barcelona conference during which a pact to protect the Mediterranean from pollution was arrived at. Currently, Syria is planning to join this pact which specifies:

--Cooperation among the states to combat oil, and other forms of pollution of the Mediterranean.

--Protecting the Mediterranean from pollution resulting from aircraft and ships sinking.

As such, Syria very much needs to join this important international treaty and to work through its protocol.

Capabilities of the General Directorate of Ports

The director stated that the General Directorate of Ports has established a laboratory to analyze sea water in order to regularly learn of the level of pollution. The laboratory has produced good results and the Directorate is now working to expand it in cooperation with the Higher Science Council and the Ministry of Public Works...this, in addition to the knowledge that the Directorate has a special division for pollution control but cannot do the job of pollution control without additional support.

Despite all this, a number of things which will reduce incidents of pollution must be mentioned, and they are:

--The administration of oil terminals should be more careful to prevent the seepage of oil through its pipelines and facilities into the sea especially the Tartus and Latikiyyah terminals. This would require the availability of a technical apparatus.

--The construction of special facilities to convert sewage water into agriculturally beneficial materials. Sewage water is not less dangerous than other pollutants in killing sea life.

Follow-Up

The survey presented by the director of port affairs concerning the pollution of the Mediterranean confirms the following three important points:

1. The Mediterranean and especially the Syrian coast are more susceptible than others to pollution.

This means that the pollution of our coastal waters has reached a high level which will not permit in the future the existence of sea life.

2. Pollution Control depends upon increasing the number of specialists, equipment and transportation machinery and upon strict supervision and the elimination of violations.

If the pollution of our coast to this degree is due to the lack of cadres and equipment, then additional appropriations should be made in order to protect the coast from pollution. Otherwise violations will increase and so will the rate of pollution.

Perhaps those concerned believe that we are not in need of marine life and that this could be substituted by "land fish."

Perhaps there are land fish.

3. Fining violators sums of money that could be very large.

This, however, does not necessarily mean that violations could be removed through the removal of polluted water, purifying it and pumping it back in again, and by collecting the polluting elements and transporting them to some other place.

Does our ability to collect a billion pounds as a price for the marine life in our coastal waters mean that pollution becomes a "license" without subject to fines?

This is a sad and regrettable fact concerning the condition of the Arab Syrian coast; while everyone plans and formulates programs, marine life is being destroyed.

Where is this marine life if the situation is like this?

1. The freedom to fish by dynamite is total freedom without deterrents.
2. The Syrian coast, more than any other, has been subjected to pollution.

If fishing by illegal means were prohibited, and if modern methods were used to eliminate pollution, wouldn't this mean that the fish resources will in time become a popular food rather than a food for the rich as it is now?

Instead of searching for underground resources to extract, we have a resource, no less valuable than others, that we squander and it is one that need not be discovered but is in need of protection.

Lastly, if international coasts are treated in the same manner as the Syrian coast is being treated, marine life would become so scarce as to be seen only in museums and in aquariums that house rare species.

8907
CSO: 5000

REDUCING ENVIRONMENTAL POLLUTION CAUSED BY TES

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 7, Jul 77 pp 63-65

[Article by I. Strikha, candidate of economic sciences: "Why Does a TES Smoke?"]

[Text] Power engineering differs from the other branches of the national economy in that the basic raw material (fuel) that arrives at thermal electric power stations (TES) is completely converted into waste products after it is used to generate electricity. In the United States, for example, electric power stations are responsible for 56 percent of the sulfur dioxide and 33 percent of the solid particles that are discharged into the air.

When they use solid fuel, TES's can also be a source of radioactivity in the area of the ash dumps. Although the radioactivity of ash residues is lower than normal, it is still commensurable with the analogous discharges of AES's. Besides this, as the result of natural processes that occur because of mechanisms that are not entirely clear, solid fuel ash that is found in dumps is enriched with elements that were originally either present in very small quantities or were entirely absent.

How can we stop the further pollution of the atmosphere by TES's? What can be done in this respect in our country?

Scientists at the Tomsk Institute of Atmospheric Optics of the USSR Academy of Sciences' Siberian Division have built a laser radar, or so-called lidar, that makes it possible to carry out atmospheric sounding on an operation basis. The practicality of monitoring operations conducted with the help of lidars cannot be compared to that of the known methods that have been used up until now. Laser technology offers great promise for use in the creation of systems for observing the state of the surrounding atmosphere, as well as for determining the degree of participation of individual sources in its pollution.

In order to increase the effectiveness of the measures now being used to reduce contamination of the air basin, the creation of a statewide observation system is being planned. An interconnected automatic air pollution monitoring system (ASKZV) has already been developed in the USSR. Its introduction will make it possible to carry out the following operations simultaneously: gather evidence about the pollution of the air basin by individual sources, predict this process, and plan the proper siting of enterprises that have not yet been built. The prototype of this system is being tested in Leningrad.

However, these are global measures. How do matters stand with the TES's themselves?

In this case we have the following ways of solving the problem: introducing modern combustion methods; desulfurization of the fuel or exhaust gasses; improving the ash cleaning systems and insuring their efficient and continuous operation; reducing the quantity of drainage water and introducing circulating water supply systems.

It goes without saying that power engineers already know of these measures for countering harmful discharges. However, they are used on a piecemeal basis and with inadequate efficiency. Therefore, it is advisable to discuss in more detail several organizational and technical measures that can be used, to some degree or another, at the Belorussian TES's.

For example, it is a well-known fact that the contamination of the environment by nitrogen oxides, as the result of TES operation, is determined both by the operating condition of the boiler plants and the original composition of the fuel. Inasmuch as power engineers are hardly able to change the types of fuel that are burned, primary attention must be focused on determining the optimum working conditions for the boilers.

Research that has been done in the Soviet Union and abroad shows that recirculation of the combustion products in air lines with hot air and two-stage combustion of the fuel are most effective measures. It has been established that the discharge of nitrogen oxides can be reduced by 50-67 percent by instituting the proper operating conditions and structural measures in boiler plants.

The development of measures to halt harmful TES discharges requires an integrated approach, because reducing the content of some components can actually cause an increase in the content of others. For example, the use of gas recirculation and two-stage combustion to suppress nitrogen oxides can lead to an increase in the carbon monoxide and hydrocarbon content. The

presence of soot particles in exhaust gasses intensifies the conversion of sulfur dioxide into sulfur trioxide, which is more toxic and results in the appearance of low-temperature corrosion.

The discharge of soot and coke particles during the combustion of fuel oil can be halted by finer vaporization of the oil. For example, reducing the size of the droplets from 500 to 50 microns reduces the amount of time required for their complete combustion by about 90 percent. If the fuel oil is vaporized into droplets less than 30 microns in size, there will be no soot at all. For more efficient combustion, it is recommended that the fuel oil be preheated to 130°C, while it is advisable to preheat some grades of heavy, substandard fuel oils to 250-400°C. The addition of 10 percent gasoline to fuel oil will cause a 35 percent reduction in the discharge of soot with the combustion products.

Sootless fuel combustion can also be achieved by swirling the air current in the burner. To a certain degree, such swirling also insures internal recirculation of the combustion products. The flame's temperature drops, which results in a reduction of the amount of nitrogen oxides. The necessary degree of swirl must be determined experimentally for each type of burner.

The combustion of fuel oil in the form of water-fuel emulsions has a number of advantages over other combustion methods. In this case there is a sharp reduction in the generation of nitrogen oxides, the discharge of solid particles is reduced by 95 percent, and the sulfur dioxide output is lowered by 50 percent. When they are properly mixed with air, uniform distribution of the dispersed drops of water and fuel insures practically sootless combustion.

At the present time there are more than 70 known methods for reducing discharges of sulfur oxides with exhaust gasses. Some of them have undergone experimental testing in experimental or industrial units and have received positive evaluations for operational use. Many of these methods are quite promising.

For example, hydrocleaning has been successfully used at the Moscow Petroleum-Processing Plant to remove sulfur from oil from Ukhta and Samotlorsk. At Saratovenergo's [Saratov Regional Administration of Power System Management] TETs-3 and TETS-4, the stipulated method is gasification of sulfur-containing fuel oil, using nonresidue gasification with subsequent high-temperature removal of sulfur compounds, soot, and vanadium from the product by the Institute of Mineral Fuels' method. An industrial unit for the gasification of fuel oil in an air blast, utilizing techniques developed at the USSR Academy of

Sciences' Institute of High Temperatures, is being built at the Dzerzhinskaya TETs. This installation is supposed to remove sulfur and vanadium. By using the fuel oil gasification method in conjunction with desulfurization of the exhaust gasses, it is possible to reduce the discharges of sulfur and nitrogen oxides and ash by 95, 80, and 100 percent, respectively. However, it is necessary to mention that no single method of cleaning gasses and processing fuel can completely eliminate all harmful impurities. In order to scatter the harmful substances, therefore, smokestacks will continue to be used in the future; this is particularly relevant in view of the increases in TES capacities.

The existing methods for removing sulfur oxides from exhaust gasses are still imperfect. Work on improving them should be directed at developing methods for regenerating the reagents that are used, eliminating contamination of the inner surfaces of scrubbers by deposits that are difficult to dissolve, and obtaining simple sulfur or commercial-grade sulfuric acid.

Measures for removing sulfur from the fuel or exhaust gasses have not yet been introduced at the Belorussian SSR's electric power stations. At the same time, considerable work is being done on reducing discharges of nitrogen oxides. In particular, this can be said about the stations belonging to Belglavenergo [probably Belorussian SSR Main Power Supply Administration]. Operational (regulating boiler unit loads, allowing only small amounts of surplus air to circulate) and structural (recirculation of combustion products into the air duct, with two-stage combustion) measures are also being implemented. It is expected that all this will result in a 50-67 percent reduction in discharges of nitrogen oxides.

At modern TES's, the removal of ash from exhaust gasses is done primarily with the help of electric filters. The degree of purification is very high, and reaches 99.3-99.6 percent. However, certain difficulties are encountered in the operation of these filters. First of all, the composition of the fuel and the ash is not stable. For example, a changeover from high- to low-sulfur fuel can lead to a reduction in the degree of purification from 99 to 89-90 percent when the same electric filters are used. In such cases it is necessary to provide the filters with additives that lower the ash's specific electric resistance; that is, the filters are conditioned with water vapor or sulfur trioxide. When this is done, the ash particles adsorb the anhydride and get larger, which changes their electric conductivity.

Nevertheless, the problem of cleansing the basic discharges of TES's (rinsing and recovered chemical purification water;

solutions remaining after the cleaning of heat exchanges and the water used to wash regenerative air preheaters; water contaminated by petroleum products) remains an urgent one. The discharges of a TES with a productivity rate of up to 100 tons per hour add up to 100,000 tons of salts to water holding areas every year. This can cause substantial disruptions in the habitation conditions for living organisms.

According to recommendations made by the VTI [All-Union Institute of Heat Engineering] imeni F.E. Dzerzhinskiy, polluted TES waters should be purified as efficiently as possible. For example, it is suggested that water from which the petroleum products have been removed should be used to trap and wash away ash, in the chemical cleaning units of heat exchanges, to maintain the water level in units for washing heating surfaces acted upon by waste gasses, or for other analogous purposes. Hydraulic ash removal systems should be based on a closed, circulating water supply system that uses the scavenging water to feed the evaporators and vapor converters. The salts that form in them should be either reprocessed or buried.

Water that has been used to wash regenerative air preheaters contains acids and other substances in a dissolved or suspended form. These other substances include compounds of iron, nickel, copper, and vanadium. According to recommendations from the VTI imeni F.E. Dzerzhinskiy, this water can be neutralized with quicklime and caustic soda. However, as a test of this method at the Kostromskaya GRES showed, it does not always produce positive results. There the method proposed by the scientists was improved, with only caustic soda being used to neutralize the wash water and the degree of purification being determined by the water's acidity (its pH had to be at least 8.5). The proper proportion of reagent was determined preliminarily, by treating samples in the laboratory. Drainage water neutralization took 30 minutes, after which the precipitate was allowed to settle. The clarified water can be used again or discharged into the common water holding area. The metals in the precipitate can be recovered.

In some cases, cooling towers can be used to purify drainage water containing different organic substances, including petroleum products, hydrogen sulfide, ammonia, phenols, and cyanides. Small quantities (up to 5 cubic meters) of polluted water are fed into a basin, where biological oxidation of the impurities takes place because of the development of micro-organisms. The main part of the oxidation products escape from the water into the air. In a number of cases, the use of a cooling tower to purify drainage water makes it possible to avoid having to build special purification installations.

To a certain extent, the economical consumption of power resources contributes to reducing environmental pollution. More precisely, this means reducing the consumption of fuel for the production of power. The importance of the work being done to improve electric power stations that utilize fuel is emphasized by the fact that increasing their efficiency by only 1 percent will make it possible to reduce fuel consumption throughout this country by 15 million tons per year. The introduction of economy measures at electric power stations is usually 67-80 percent cheaper than the cost of extracting the amount of fuel that is saved.

During this five-year plan there will be a slight reduction in the proportion of capacities put into operation at condensation and thermal electric power plants. At the same time, there will be intensive development of atomic power engineering. In the near future and for the next few decades, however, the production of electricity at TES's will be considerably higher than at other types of stations. It is assumed that even by the end of the century, more than half of our electricity will be generated at TES's that burn all types of organic fuels. This is why it is so urgent that we see the soonest possible mastery of the proposed (and development of new) methods for reducing the degree of environmental pollution by harmful discharges formed during process of generating electricity.

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SOVIET-BRITISH COMMITTEE TO MEET ON ENVIRONMENTAL PROTECTION

LD032010Y Moscow TASS in English 1938 GMT 3 Oct 77 LD

[Text] Moscow, October 3 TASS--The fourth session of the mixed Soviet-British committee for cooperation in environmental protection opens in Moscow on Tuesday. Specialists of the two countries will discuss the results of joint work in the current year and plans of research in 1978.

The joint work of Soviet and British scientists is carried out within the framework of the inter-governmental agreement signed in May 1974, a TASS correspondent has been told by Yuriy Izrael, head of the main board of the Hydrometeorological Service at the Council of Ministers of the USSR. He will lead a Soviet delegation to that session. In 1977 cooperation was conducted in seven important problems, each of them including several themes. Among the areas of cooperation are water protection from pollution, comprehensive use of water resources, anti-noise measures.

Soviet and British specialists learned about accomplishments of both countries on questions of interest to them.

CSO: 5000

USSR

RSFSR COUNCIL OF MINISTERS DECREE ON WATER RESOURCES LEGISLATION

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA ROSSIYSKOY SOVETSKOY FEDERATIVNOY SOTSIALISTICHESKOY RESPUBLIKI in Russian No 1, 1977 p 7

[Decree of the RSFSR Council of Ministers of 4 November 1976 No 605 on water resources legislation]

[Text] Article 2 On a partial change in the decree of the RSFSR Council of Ministers of 18 February 1963 No 204 "On the Establishment of Fines for the Violation of Rules for the Protection and Utilization of Water Resources"]

The RSFSR Council of Ministers hereby resolves:

To make a partial change in the decree of the RSFSR Council of Ministers of 18 February 1963 No 204 "On the Establishment of Fines for the Violation of Rules for the Protection and Utilization of Water Resources" (SP RSFSR, 1963, No 5, Article 28), presenting paragraph 5 in the following form:

"Fines are imposed by the chief of the Main Administration for the Protection of Water Resources of the RSFSR Ministry of Land Reclamation and Water Economy, the chiefs of the basin (territorial) administrations for regulation of the utilization and protection of water of the RSFSR Ministry of Land Reclamation and Water Economy and their deputies, under the policy established by the Statute on Administrative Commissions Under Executive Committees of Rayon, City, Rural and Village Soviets of Workers' Deputies of the RSFSR and on the Policy for Cases of Administrative Violations, which was approved by an Ukase of the Presidium of the RSFSR Supreme Soviet of 30 March 1962."

Chairman of the RSFSR Council of Ministers,
M. Solomentsev

Business Manager of the RSFSR Council of Ministers,
I. Smirnov

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USSR

WATER RESOURCES LEGISLATION IN BRYANSKAYA OBLAST

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA ROSSIYSKOY SOVETSKOY FEDERATIVNOY SOTSIALISTICHESKOY RESPUBLIKI in Russian No 10, 1977 pp 164-171

[Decree of the RSFSR Council of Ministers of 18 May 1977 No 276 concerning water legislation]

[Text] 100 On Recognizing as Invalid the Decisions of the RSFSR Government Regarding the Decree of the USSR Council of Ministers of 20 January 1977, No 57.

In connection with the decree of the USSR Council of Ministers of 20 January 1977, No 57, "On Recognizing as Invalid Certain Decisions of the USSR Government Regarding Questions of Electric Power," the RSFSR Council of Ministers hereby resolves:

To recognize as invalid:

Points 1-3 of the Decree of the RSFSR Council of Ministers of 25 March 1950 No 315, "On Conditions for the Operation of Hydroelectric Power Stations, Mills, and Hulling Mills Constructed on Irrigation Canals";

Subpoint "a" of point 2 of the decree of the RSFSR Council of Ministers of 19 August 1954 No 1334 "On Measures for Improving the Operation of State Agricultural Milling Enterprises";

The decree of the RSFSR Council of Ministers of 6 June 1963 No 696 "On Measures Providing for the Startup of Capacities at Electric Power Stations and Electric Networks in 1963."

Deputy Chairman of the RSFSR Council of Ministers,
V. Vorotnikov

Business Manager of the RSFSR Council of Ministers,
I. Smirnov

Moscow, 18 May 1977, No 276

101 On the Operation of Soviet and Water Management Agencies of Bryanskaya Oblast for the Protection and the Efficient Utilization of Water Resources.

The RSFSR Council of Ministers notes that Soviet and water management agencies, industrial enterprises, kolkhozes and sovkozes and public organizations of Bryanskaya Oblast have implemented comprehensive measures in recent years for the protection and efficient utilization of water resources.

The capacities of purification installations in the oblast have increased which made it possible in 1976 to provide for the purification of 87 percent of the waste waters and to reduce the discharge of polluted wastes by half under the Ninth Five-Year Plan.

During 1971-1975 the consumption of fresh water in the oblast decreased by 1.6 times and the consumption of water for industrial needs, by 2 times, with a simultaneous increase in the volume of industrial and agricultural production. The reduction in the consumption of fresh water was achieved because of the development of systems for recycled water supply whose capacities increased by 4 times.

In order to keep the rivers in the oblast full of water, work is being done to regulate their flow, to halt erosion of the soil and to create forested areas in water protection zones. In the basin of the Desna River alone during 1971-1975 about 26,000 hectares of new trees were planted. The implementation of these measures contributed to the improvement of the water management situation and the sanitary condition of rivers and other bodies of water in the oblast.

Still there are shortcomings and omissions in the work of Soviet and water management agencies in Bryanskaya Oblast for the protection and efficient utilization of water resources.

Only 85 percent of the capital investments allotted for water protection measures under the Ninth Five-Year Plan were assimilated. Certain water consumers--enterprises, kolkhozes and sovkozes--allow polluted wastes to be discharged into rivers and other bodies of water without purification and do not take the necessary measures for keeping up the shore zones and planting protective forested areas. Conventionally pure water is not utilized adequately in recycled water supply.

The western basin (territorial) administration for regulating the utilization and protection of waters of the RSFSR Ministry of Land Reclamation and Water Economy is not exercising adequate control over the adherence to established rules for water utilization and is not adequately taking advantage of the rights granted to it.

The RSFSR Council of Ministers hereby resolves:

1. To take note of the positive work of soviet and water management agencies in Bryanskaya Oblast for the protection and rational utilization of water resources.
2. To instruct the Bryanskaya Oblast Ispolkom and local water management agencies to take measures for further stepping up the work that is directed toward the implementation of comprehensive water management measures and the elimination of shortcomings in this matter.
3. To send a memorandum concerning the work of soviet and water management agencies of Bryanskaya Oblast for the protection and efficient utilization of water resources from the RSFSR Gosplan to the Ministries Common Department and Council of Ministers of the autonomous republics, the kray ispolkoms, oblast ispolkoms and the Moscow and Leningrad city ispolkoms.

For the councils of ministers of the autonomous republics, kray ispolkoms, oblast ispolkoms and the Moscow and Leningrad city ispolkoms, to develop measures for comprehensive utilization and protection of water resources, taking into account the work experience of soviet and water management agencies of Bryanskaya Oblast, and to present them to the RSFSR Gosplan by 1 January 1978.

For the RSFSR Gosplan, to take these measures into account when drawing up annual and five-year plans for the development of the RSFSR national economy.

4. For the RSFSR Gosplan and Ministries and Departments of the RSFSR, to take additional measures for increasing the capacities of purification installations, reducing the consumption of fresh water for industrial needs, developing systems of recycled water supply, regulating the flows of rivers, halting erosion of the soil and creating forested areas in water protection zones.
5. For the RSFSR Ministry of Land Reclamation and Water Economy, to step up control over the adherence to established rules for water use, the construction of water protection installations and the implementation of measures for preventing pollution of rivers and for protecting them from drying up.

Chairman of the RSFSR Council of Ministers,
M. Solomentsev

Business Manager of the RSFSR Council of Ministers,
I. Smirnov

Moscow, 24 May 1977 No 293

On the work of soviet and water management agencies of Bryanskaya Oblast for the protection and utilization of water resources.

The high growth rates of public production, construction and the expansion of cities and industrial enterprises, and the building up of rural areas, which entail an increase in water consumption and the discharge of waste waters, require a principally new approach to the problem of the protection and utilization of water resources. Soviet and water management agencies of Bryanskaya Oblast have accumulated positive experience in finding a comprehensive solution to this problem.

In implementing the decisions of the twenty-fourth and twenty-fifth party congresses and the instructions of General Secretary of the CPSU Central Committee Comrade L. I. Brezhnev regarding rational utilization of natural resources and protection of the environment, soviet and water management agencies of Bryanskaya Oblast have done a considerable amount of work in recent years for improving the utilization of water resources in the Desna River basin.

The Desna River with its numerous tributaries is of primary importance for the oblast as a source of water for the needs of the population, industry and agriculture. But during the last two decades the fact that the river has rapidly become shallower and the quality of the water has deteriorated because of the discharge of unpurified wastes has had a negative influence on the water supply for the national economy. This made it necessary to conduct comprehensive measures for efficient utilization of water resources, purification of waste waters, land reclamation, the fight against wind and water erosion and regulation of the flow.

To these ends, on the initiative of party and soviet agencies in the oblast, a general plan was developed for comprehensive utilization of water and land resources in the Desna River basin during 1971-1985. The plan envisions solving a number of important problems: water-protection areas planted in trees, construction around small rivers, regularization of water consumption and water drainage, anti-erosion measures and other measures.

The materials of the plan made it possible to comprehensively evaluate the availability of surface and underground waters, their condition and utilization and to determine the sequence of work for protecting the water from pollution and exhaustion. The plan is the basis for the development of annual and five-year plans for the utilization and protection of water resources.

The certification of small rivers that was done in the oblast in order to determine their condition and the possibilities of utilizing them in the interests of the national economy was of positive significance.

The implementation of a complex of measures for the protection and efficient utilization of water resources is at the center of the attention of soviet and water management agencies in the oblast. These questions are regularly considered in the oblast ispolkom, the kray ispolkoms, and the oblast people's control committee. During 1975-1976 ten questions related to this problem were considered in meetings of the oblast ispolkom.

At meetings of the permanent commission for the protection of nature of the oblast soviet of workers' deputies, from September 1975 through December 1976 alone, members heard reports on six questions pertaining to the fulfillment of water legislation and the protection of water from pollution, observance of norms and rules for applying and storing herbicides and fertilizers and the work of a number of rayon ispolkoms for the protection of nature.

A large amount of propaganda and organizational work for coordinating the work of soviet and economic agencies for the utilization and protection of natural resources is being done by the permanent interrepublic committee on problems of the Desna River basis which was created on a public basis in Bryansk. It includes representatives of interested organizations in eight oblasts of the RSFSR and the Ukrainian SSR and the committee is headed by the first secretary of the Bryanskaya CPSU obkom, Comrade M. K. Krakhmalev.

Because of the large amount of organizational work conducted by soviet and water management agencies, large measures have been carried out in the oblast for improving the condition and the utilization of water resources.

Primary significance is attached to the work for preventing pollution of small rivers and other bodies of water and reducing the expenditure of fresh water for industrial needs.

During the Ninth Five-Year plan facilities for purification of wastes with a capacity of 150,000 cubic meters an hour were put into operation. Purification installations were constructed in the cities of Bryansk (section I), Klintsi, Novozibkov, Zhukovka and Starodub and these installations are under construction in the cities of Bryansk (Section II), Pochep, Klimovo and others. Their overall capacity is 120,000 cubic meters a day. Local installations have been put into operation at many industrial enterprises. They are capable of purifying 2,000-6,000 of industrial wastes a day and there are also installations for preliminary purification of waste waters--at twelve industrial enterprises with a productivity of more than 10,000 cubic meters a day.

Because of this, the overall capacity of purification installations in the oblast reached 224,000 cubic meters a day which made it possible under the Ninth-Five Year Plan to reduce the discharge of polluted wastes by 140,000 cubic meters or by 2 times and during 1976--by another 74,000 cubic meters a day.

The consumption of fresh water during these periods of the Ninth-Five Year Plan decreased by 1.6 times and amounted in 1976 to 714,000 cubic meters a day including 536,000 cubic meters for industrial needs compared to 1,063,000 cubic meters a day in 1971. Thus the withdrawal of water from water supplies for production needs decreased during this period by 2 times with a simultaneous increase in the volume of industrial and agricultural production.

The reduction in the consumption of fresh water was achieved because of the development of systems of recycled water supply whose capacity increased by 4 times under the Ninth Five-Year Plan and reached 960,000 cubic meters a day in 1976 (65% of the overall water consumption for industrial needs). At a number of enterprises the systems for recycled water supply also utilized conventionally pure water. One should take note of the positive work for introducing closed water supply cycles at the automotive plant, the cement plant, the phospherite plant, the plant for irrigation machine building and others.

In order to insure that the rivers in the oblast are full of water, a considerable amount of work is being done to regulate their flow through the construction of water reservoirs.

While under the Eighth Five-Year Plan 30 ponds and reservoirs with a capacity of 2.9 million cubic meters were constructed, during the Ninth Five-Year Plan more than 200 water reservoirs were constructed with a water supply of 33.6 million cubic meters. And in the oblast as a whole there are 350 ponds and water reservoirs with a capacity of 45 million cubic meters. Kolkhozes and sovkozes of Novozibkovski, Starodubski and Mglinski rayons are successfully constructing water reservoirs and ponds. Each of them has constructed 20 or more of these objects.

The experience in creating ponds and water reservoirs in the oblast have shown that they make it possible not only to regulate the water schedule of the rivers, but also to solve a whole number of other important economic and social problems. Many ponds and water reservoirs are used for raising fish. Thus the construction of a water reservoir on the Unecha Sovkoz with an area of 550 hectares with a water supply of 8.5 million cubic meters made it possible to create the largest fishery in the oblast.

Important work done in the oblast for growing forests along the banks of the water protection zone and near the upper reaches of rivers of the oblast also contributes to keeping the rivers full of water. During 1971-1975 forestry enterprises in the oblast planted 25,600 hectares in forests in the Desna river basin and reseeded less valuable plantings on an area 2,000 hectares.

In order to prevent soil erosion which not only reduces its productivity, but also deteriorates the water condition in small rivers, the oblast is constructing anti-erosion hydrotechnical installations, supporting gullies,

sandy areas and other land that is subject to erosion, creating field protection forest strips and doing anti-erosion cultivation of the soil.

During the years of the Ninth Five-Year Plan alone, the sovkozes and kolkhozes of the oblast planted trees on an area of 12,600 hectares, including 6,600 hectares of sandy land and 5,300 hectares of gullies. Additionally, field protection forest strips were created on an overall area of 1,100 hectares and 28 kilometers of water retention furrows were constructed at the tops of existing gullies.

The development of 265 gullies and ravines on the fields ^{was} curtailed and some of them are being used as water reservoirs while others are being used as feed and forest lands.

The implementation of a complex of measures for the protection and efficient utilization of water resources of the Desna River basin is having a positive effect on the purity and amount of water in rivers that flow here. The water in rivers has become significantly cleaner; the numbers of fish and water fowl have increased and conditions for supplying water for the urban and rural population have improved.

Soviet and water management agencies of the oblast have earmarked a program for further improvement of the utilization of water resources under the Tenth Five-Year Plan.

The Bryanskaya Oblast ispolkóm has approved measures for 1976-1980 which envision the creation of new systems for recycled water supply and purification of water, the construction of water intakes from rivers, regulation reservoirs, anti-erosion and other water protection installation as well as the planting of forests on an area of 40,000 hectares.

The implementation of these and other earmarked measures will contribute to significant improvement in the water management situation in the oblast.

Taking note of the positive work conducted in Bryanskaya Oblast on the aforementioned problems, the RSFSR Gosplan would consider it expedient to send this note to interested ministries and departments, councils of ministers of autonomous republics, kray ispolkóms, oblast ispolkóms, and the Moscow and Leningrad city ispolkóms.

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CSO 5,000

USSR

BRIEFS

BALTIC POLLUTION SYMPOSIUM--A Soviet-Swedish Symposium on protecting the Baltic Sea from pollution has ended in Jurmala. Taking part were chemists, biologists and oceanographers from both countries, and observers from the GDR, Poland and Finland. A plan was worked out for joint expeditions to study biological processes in the Baltic Sea. They will be carried out by oceanographical vessels of the USSR Hydrometeorological Service. [Text] [Moscow Domestic Service in Russian 0700 GMT 3 Oct 77 ID]

CSO: 5000

SPAIN

BILBAO MAY BE DECLARED CONTAMINATED ZONE

Madrid EL PAIS in Spanish 8 Sep 77 p 16

[Text] The paralyzation of all activities that could affect the area of Donana, and a proposal that the government declare Bilbao an "air-polluted area" are the main items agreed upon Tuesday by the Interministerial Commission on the Environment (CIMA) during its 19th general assembly. The assembly took place in Madrid, and was presided over by the undersecretary of territorial and environmental regulation, Eduardo Merigo.

During a press conference, Merigo stated that declaring Bilbao an air-polluted area means that the civil governor of Vizcaya will be able to order the closing down of the industries which cause the most pollution. He commented, however, that the decision to close down factories will be made only when the pollution danger presents an extreme threat to human health.

With regard to the National Park of Donana, the CIMA decided to undertake an immediate effort to design a plan that will define possible actions to be taken in the park and its environs. As a consequence of this decision, the CIMA believes it is essential to stop all activities in progress that could have an effect on the area.

Along the same line, Merigo reported that the department of tourism has accepted CIMA's proposal to halt all activities involved in the urbanization of the Valcotos mountains. The emergency revision of this project has been entrusted to the tourism and environment committee of the CIMA.

Other agreements adopted at the above-mentioned assembly include the decision to draw up a catalogue of natural parks so that the Committee for the Defense of Nature can devise a national plan for the protection of certain areas. The assembly also decided to take measures to reduce the current rates of pollution which have been recorded in Huelva, and to entrust the tourism and environment committee with the study of the environmental impact of urbanization on the Grao Lagoon and the D'en Colom key (Minorca), as well as the Sierra Nevada (Granada). Finally, the assembly agreed to draw up reports on the environmental problems resulting from various projects in Villanueva and Geltru and Dragonera Island.

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CSO: 5000

SPAIN

RESORT AREA THREATENED BY INCREASED POLLUTION

Barcelona LA VANGUARDIA in Spanish 11 Sep 77 p 23

[Text] Summer, as irregular as it was unsociable during times when it is generally nice and pleasant to go to the beach, has ended for this year. The beaches along the Barcelona coast were nevertheless frequented at least as much as, if not more than, other years. The extremely hot days, although few, showed once more what a spectacle can be created by a crowd of bathers packed together on the sand, next to a sea which is more and more polluted every day. The old problem of obtaining a widespread, coordinated effort to improve the waters which empty into the Mediterranean along the beaches of the province of Barcelona has emerged once more as a subject for comment and criticism. But we have not progressed at all. Everything is still the same; vacationers' hopes have turned into desperation. That ambitious project which involved creating a true sanitary infrastructure along the coast silently sleeps in some government file cabinet, a mere irony or even a joke after those official pronouncements which seemed to be the long-awaited answer to the problem.

There was and still is, in the legal documents, a consortium between the provincial delegation of Barcelona and the Hydrographic Confederation of the eastern Pyrenees which was going to carry out such an important program. Not too long ago it was proudly announced that that initiative, promoted by the state through the former Ministry of Public Works, was part of an economic cooperation program. All interested municipalities had expressed their support, and had promised proportional aid to the initiative. The idea fostered by the Ministry of Public Works (which later tried to directly encourage the provincial deputation of Barcelona) never gelled, and that inspiring promise has faded into oblivion. All that remains, as a motive for justifiable criticism, in the minds of the long-suffering bathers, is the lament that thousands and thousands of people have expressed as they walk along the stinking, filthy beaches of the province of Barcelona.

When Will the Purifying Plants Be Installed?

When will the purifying plants be installed? These plants have been designed by experts to clean up the long stretches of fine sand which make up the beaches of Barcelona, as well as the areas adjacent to them, and leave them free of any health hazard. This is a question which no one can answer, for no one

seems to remember any longer the promises and optimism of that consortium that awakened so many hopes when it was announced. There is reason to feel that we have been cheated. In view of the lack of activity in such an urgent project, someone must feel a desire and an obligation to take action at last; the time already lost has presented a serious risk to public health. To leave things as they are now, without implementing the solutions which the problem demands, is tantamount to evading the responsibility for a grave error which is indeed the primary responsibility of the organization which has been entrusted with the supervision of public health. How can the provincial health authorities avoid taking vigorous measures in this situation? The serious hazards which bathers on the beaches of Barcelona are being subjected to have already been presented in great detail by those authorities, two years ago. But the only outcome was some recommendations. Even those recommendations have been forgotten, whether because of the inefficacy of earlier attempts or for other reasons. This silence among health authorities, as well as that maintained by those responsible for the projects which can and should do away with this serious pollution problem, has been severely criticized and condemned by bathers this summer. However, there have not been any health warnings which should be made public in order to publicize the dangers presented by highly contaminated waters on our beaches. Summer is almost over, and although the criticism voiced in this column, in the form of an alert, a popular outcry, is too late to correct the main hazard, it is hoped that it will at least serve in part to end the silence we have mentioned earlier, and galvanize officials and administrators into action so that a sanitary infrastructure can be established without delay.

Sewage Control

To mention here the degree of contamination of the waters along most of the beaches in Barcelona, from Malgrat to Cubellas, would be to reiterate something already well-known to everyone. Household and industrial pollution has already reached such high limits that, according to reports by knowledgeable experts, the waters along this coast contain bacilli (possible conductors of disease) in quantities which are 300 times the normal rate. These levels can be observed in places where fecal waters or solid residues are most prevalent, and it has been proved that from Cubellas to Malgrat there are at least 80 places of this type, where sewage is emptied into the sea. This information comes from data compiled in 1971. Since then the number has undoubtedly grown considerably. The areas of this type which already exist are becoming more and more hazardous. It must be remembered that the population areas grow at an accelerated rate, and by the same token industrial facilities situated in the towns along the Barcelona coast also continue to grow. Most of these facilities have no means to purify water before it is emptied into the sea. Here is a statistic that serves as a warning: by 1985 it is estimated that the amount of sewage emptied into the sea will be double what it is now in the area we are referring to, that is from Malgrat to Cubellas.

Bathers' Health Comes First

These figures, along with the simple observation of the deteriorated condition of our beaches, considered now at the end of the summer of 1977, cause us to

take this problem very seriously, as it is growing more severe by the minute. It is easy to be pessimistic and predict total chaos along the coast of Barcelona if this sanitary infrastructure which was considered an urgent necessity several years ago is not put into effect immediately. If work is delayed and the waters continue to be emptied into the sea in the same highly-polluted state, only one measure can be definitively applied: close down the beaches, keeping bathers away as a means to protect their health. The solution will not be applauded by the public, but without a doubt someone has to solve this problem. More important than the enjoyment of the recreational possibilities of the sea is the protection of bathers' health. This is an important issue and requires the attention of the appropriate authorities. To ignore this problem is, in this case, a breach of responsibility.

8926

CSO: 5000

COST OF ENVIRONMENTAL PROTECTION TO INDUSTRY DISCUSSED

Hamburg DIE ZEIT in German 16 Sep 77 p 33

[Article by Wolfgang Hoffmann: "No More than Killer of the Recovery?"]

[Text] With increasing frequency industrialists complain about the crippling burdens the state imposes on them for the protection of the environment: Waste removal, noise abatement, clean air and waste water levies serve to raise costs and add to the risks involved in new investment. At the same time citizens initiatives rejoice in their successes regarding the delays on motorways, power plants and factories. A new slogan is making the rounds: Environmental protection--killer of the recovery.

True, there is no doubt that some German industries have lost orders worth billions simply because individual citizens and citizens initiatives insisted on environmental rights and pursued them to the highest courts (see ZEIT No 36, "The Great Blockade"). Yet, environmental control also provides new jobs.

More and more firms have got used to living with environmental protection, and more and more they are discovering new sales opportunities as a result of environmental control. In northern Germany three compost processors recently combined in order to profit from the mountains of chicken dung available from Friesian poultry farmers. Dried and processed this manure is most acceptable to north German peat producers, because peat mixed with chicken manure makes an even better fertilizer.

Feldmuehle AG (Duesseldorf) deplores--at least from the aspect of that firm--the anti-ecological "white" indoctrination in the Federal Republic. For years the detergent industry has hammered away at German citizens to impress them with the desirability of a white wash. Consequently, to the sorrow of the paper industry, citizens refuse to settle for cheaper and more ecological gray paper, such as Feldmuehle produces from waste.

Industrial waste is used in Bochum also. A test plant already supplies electricity to some Bochum residents. Aluminum producer Udo Giuliani in Ludwigs-hafen has ceased to allow his wastes to escape through the chimney. Aluminum

residue, red clinker, was discovered to be a cheap substance for cleansing and processing water. The firm developed a new market by producing ancillary facilities for municipal and other purification plants. For many years past Starck AG of Berlin has produced high-quality tantalum. The firm, one of only four worldwide, purchases tin slag wherever it is obtainable and processes it into the raw material which is much in demand. Forty percent of the world demand for tantalum are already produced from the waste product tin slag.

The Karlsruhe-Augsburg Industriewerke also do flourishing business with environmental technology. Their sales of waste removal equipment are rising steadily. The firm complains only that the municipalities in the Federal Republic usually have too little money to install garbage composting plants which would free them from worries about the further use of garbage and provide horticulturists with excellent fertilizer.

There are no statistics showing the significance of the environmental industry for the labor market. Evidence is available, however, of the economic significance of recycling in at least some sectors. That holds true primarily for raw materials, a sector in which the Federal Republic is largely dependent on imports, due to the lack of its own raw material sources.

A study by the Research Institute for Technological Trends ascertained the incidence of recovery of used materials and byproducts for five important nonferrous metals: 45 percent of German lead consumption is represented by recycled lead. The percentage of recovery is 40 for copper, 37 for tin, 27 for aluminum and 22 for zinc.

Still underdeveloped but also advancing in the Federal Republic is the utilization of animal wastes incident upon mass husbandry. The environmental benefits of the processes developed are at least as important here as the economic profit of recycling. Mass animal husbandry produces some highly unpleasant smells so that locations for large farms are very hard to find. Thanks to new facilities for the burning and processing of animal waste pollution can be drastically reduced. The 5.5 tons of chicken dung daily produced by 50,000 chickens on a small farm no longer pollute the environment. In addition the stuff is bringing a profit--in the shape of farm and garden manure, and sometimes also as feed.

In view of the rising demand for feed all over the world, this industry is becoming particularly important. Processed chicken dung costs 50 percent less than comparable protein-rich fodder available on the market now.

Beef cattle feeding (currently barely profitable in the Federal Republic) demonstrates the potential benefit of this dung processing to the farmer. The use of recovered fodder could save 30 percent of feed costs. At the moment, though, the Ingenieurburo Suhrbeck is selling its processing plant mainly to Eastern Bloc countries. In the Federal Republic the recycled dung may be sold only as manure, not as fodder.

New fields are opening up for industry especially where the inflation of raw material prices on the world market is matched by the environmental damage arising from all kinds of garbage:

- 100,000 tons of recovered paper, for example, save 15 million trees from the ax;
- Every year 350,000 tons of tires are discarded in the Federal Republic. Only about 90,000 can be retreaded, the remainder goes to the dumps. Now processes have been developed for coking old tires with hard coal or using them to produce floor coverings for sports arenas. Raw material wastes become commercial goods.

The first to recognize this trend was the Hamburg Chamber of Industry and Commerce. In 1973 it set up a waste exchange. The firms notify the exchange of useable waste materials, and the exchange in turn alerts potential buyers. The Hamburg example has been widely followed. The Federation of Chambers of German Industry and Commerce (DIHT) decided to set up such waste exchanges at all affiliated chambers.

In the period 1970-1974 industry and public agencies spent DM66.7 billion for environmental protection and provided the corresponding demand. DM62 billion of this amount were spent on investments, and DM42 billion were expended on subsequent operating costs. Just about two thirds of all environmental expenses were undertaken by industry. From 1975 to the end of 1979 a total of DM112.8 billion will have to be spent on environmental protection; industry's share will amount to DM56 billion.

Nobody claims that environmental protection can be had for nothing, and recycling merely helps to reduce the cost. A silenced compressor used in the construction industry, for example, costs 15 percent more than the customary noisy appliance. The higher purchasing price in turn affects construction costs. A study carried out in Rhineland-Palatinate in 1974 established the costs of environmental protection measures in the construction industry as DM754,000. That is .5 percent of total investments by this industry. However, environmental researcher Karl-Heinrich Hansmeyer comments: "If, for environmental reasons, additional requirements are made on the products of the building industry, these do in fact involve increased construction costs for the client (insofar as additional construction measures are involved); the construction industry, on the other hand, benefits on the whole, because the usual result is an increased volume of contracts."

Guenter Hartkopf, state secretary in the Ministry of the Interior competent for environmental policy, considers this evidence that "environmental policy, viewed as a whole, actually encourages investment."

That is quite obvious in the matter of road construction. At locations where admissible maximum values for traffic noise are exceeded, remedial measures will in future involve additional orders ranging from DM150 million

to DM4 billion per annum (and corresponding costs for public agencies). The amount of these costs (or orders) will depend on the maximum of admissible noise established by the government. By the end of September the Transport Minister intends to submit his final proposals to the Cabinet.

If the critical value for bearable noise is set at 55 decibels, Hansmeyer calculates, this might result in some 50,000 additional jobs by the mid-1980's. It is most unlikely, though, that Bonn will fix such low values. They would imply that 67 percent of all federal investment in highway construction would have to be diverted to noise abatement measures.

According to Hansmeyer's calculations additional jobs would also be created if future directives for thermal insulation of buildings were to be more stringent than they are now. Thermal insulation to save 15 percent of energy would result in a 3 percent rise in construction costs. Based on building turnover in 1975 (about DM50 billion) this would provide an additional 22,650 jobs.

The construction industry may expect another healthy rise in orders if the government intends, and is able in fact, by 1985 to meet the need for making up arrears in the construction of public purification facilities. Up to now biological or equivalent filtration facilities are lacking for 90 percent of the population. From 1975-1985 DM13 billion have been earmarked for this purpose. Use of that money would mean employment for just under 23,000 additional workers.

The construction of filtration facilities would have to be preceded by an expansion of the sewer systems, providing yet more jobs. The volume of orders for the necessary sewers amounts to DM30 billion. In addition industry will have to build filtration facilities--for the imposing sum of DM22 billion.

Some time ago Werner Meissner of Frankfurt University attempted to calculate the effect on employment resulting from all previous environmental investment including subsequent operating costs of the facilities in industry and at public agencies. According to him expenditure for environmental purposes provided 218,270 additional jobs per annum in the period 1970-1974. For the period 1976-1979 Meissner assumes an "employment effect of an average of (at least) 370,000 jobs per annum.

Rudolf Sperner, head of the IG [industrial labor union] Construction is somewhat skeptical with regard to these calculations. He admits that the construction industry has definitely profited from increased environmental protection but feels that it is very difficult to estimate the dimensions. DIHT experts are similarly skeptical. They mention that environment-based investments do not signify any expansion of production but instead result in unproductive cost burdens. That applies especially to subsequent costs, the operation of the plant.

Nobody disputes, though, that the environmental assignments provided German industry with a technological headstart which might help develop future new

export markets once other countries impose environmental controls on their industries also. For the time being, however, DIHT considers that, due to domestic environmental policies, German products are getting more expensive on the world market and therefore harder to sell. In the long run any environmental protection which is not internationalized must needs distort competition.

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END